the utmost value when used in close working, for the circles are so arranged that they can be very easily read, the horizontal circle being so adjusted that the reading can be taken when the instrument is near the roof of a mine. The telescope has a wide field of view, and on it are placed two pairs of sights made on a new principle for roughly sighting an object or station, or for use in difficult positions.

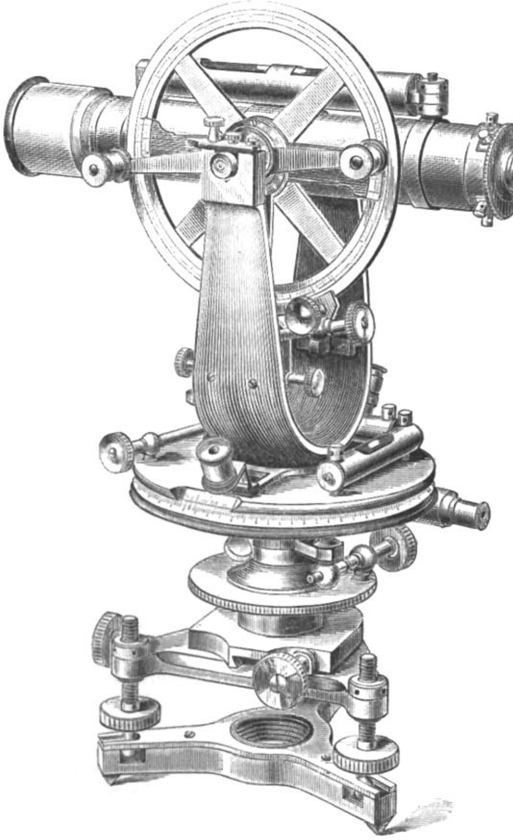

Fig. 1.

Another very compact little instrument which has been improved by the author is the box sextant with a continuous arc of 240°.

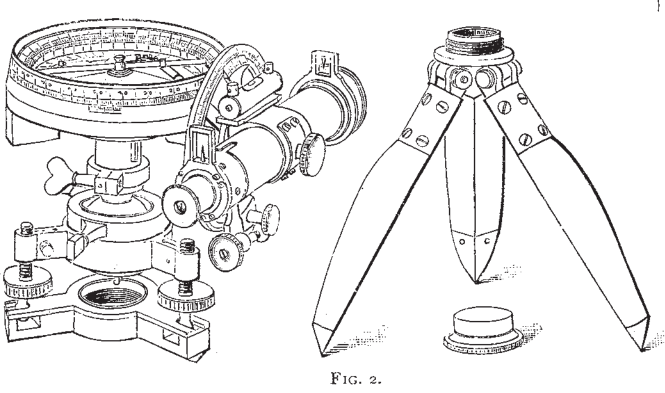

Fig. 2.

Among the miscellaneous instruments described at the end is mentioned a portable saw made of hardened steel plates riveted together in double series, and slack enough to allow the rivets to form joints. This saw "is equal to a 6-foot cross-cut saw, weight complete $2\frac{1}{4}$ pounds, including case, which measures over all $1\frac{3}{4}$ by 4 by 8 inches. Two men with this saw may cut a tree down, 12 inches in diameter, in about 10 minutes."

We need only say in conclusion that the work is deserving of the highest praise, and will be found invaluable to surveyors and others whose work makes it necessary for them to use or study instruments of this kind. For besides laying before the students of surveying or mining the principles and methods of use of each instrument of its class, and also the best tests for assuring the qualities of each, it provides information which will be of much service to skilful instrument makers. W.

PROFESSOR SOPHIE KOVALEVSKY.

THE Swedish papers bring us the sad news of the death of the lady-Professor of Mathematics at the Stockholm University, Mme. Sophie Kovalevsky. She spent her Christmas holidays in the south of France, returned to Stockholm on February 4, and began her course of lectures on the 6th. On the evening of that day she felt ill, and on the 10th she died of an attack of pleurisy. She was born in 1853 at Moscow, and spent her early childhood in a small town of West Russia, where her father, the general of artillery Corvin-Krukowski, was staying at that time; and afterwards on her father's estate in the same part of Russia. She received her first instruction from her father, but it seems that it was her maternal uncle, an engineer of some renown, Schubert, who awakened in her an interest in natural science. She early lost both her mother and her father, and, having ardent sympathy with the movement which was spreading among Russian youth, she applied for, and at last obtained, permission to study at St. Petersburg. The next year—that is, in 1869, when she was but sixteen years old—she was received as a student at the Heidelberg University, and began the study of higher mathematics. About this time, when extremely young, she married Kovalevsky, the well-known Moscow Professor of Palæontology. From 1871 to 1874, she was again in Germany, this time at Berlin, studying mathematics under Weierstrass; and at the age of twenty-one, she received the degree of Doctor of Philosophy at Göttingen. Her husband died in 1883, and the next year, in June, she was offered the chair of higher mathematical analysis at the Stockholm Högskola, on condition that she should lecture during the first year in German, and afterwards in Swedish. This she did, and most successfully too—some of her Swedish pupils already being professors themselves. Her chief mathematical papers were: "On the Theory of Partial Differential Equations" (in *Journal für Mathematik*, 1874, vol. lxxx.): "On the Reduction of a class of Abel's Integrals of the Third Degree into Elliptical Integrals" (in *Acta Mathematica*, 1884, vol. iv.)—both being connected with the researches of Weierstrass; "On the Transmission of Light in a Crystalline Medium" (first in the Swedish *Förhandlingar*, and next in the *Comptes rendus*, 1884, vol. xcviii.), being part of a larger work in which Mme. Kovalevsky shows the means of integrating some partial differential equations which play an important part in optics; and "On a Particular Case of the Problem of Rotation of a Heavy Body around a Fixed Point" (in the *Mémoires* of the Paris Academy: *Savants étrangers*, vol. xxxi., 1888). The third of these works received from the French Academy the Prix Baudin, which was doubled on account of the "quite extraordinary service" rendered to mathematical physics by this work of Sophie Kovalevsky. She was also elected a Corresponding Member of the St. Petersburg Academy of Sciences.

Besides her mathematical work, Sophie Kovalevsky had lately begun to give literary expression to her ideas

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The autobiography of her early childhood ("Reminiscences of Childhood"), published last year in a Russian review, is one of the finest productions of modern Russian literature. In 1887 she published in the Swedish review *Norna* the introduction to her novel, "Væ Victis!" And in the last issue of the *Nordisk Tidskrift* she brought out, under the pseudonym of Tanya Rerevski, a fragment of a longer novel, "The Family of Vorontsoffs," which she left in manuscript entirely ready for the printer. In her last letter to the writer of these lines in December last, she spoke of bringing out an English version of this novel, which, though written in Russian, could not be published in her mother country.

It need not be said that so highly gifted a woman as Sophie Kovalevsky was modesty itself. She took the liveliest interest in Swedish intellectual life, and had many friends both in Stockholm and in this country, which she visited last year. She leaves a daughter eleven years old. The Swedish papers speak with the greatest sympathy and regret of *their* professor "Sonya" (the little Sophie) Kovalevsky.

In Mme. Kovalevsky's "Reminiscences of Childhood," she records a fact well worthy of note. She was then about ten years old, staying in her father's house in the country. The house was being repaired, and wall-papers were brought from St. Petersburg; but it so happened that there was no wall-paper for the nursery. So it was papered with the great Ostrogradski's lithographed course upon higher mathematical analysis—a survival of her father's student years; and the little Sophie, who devoured everything printed within her reach, to the despair of her English governess, was continually reading these mathematical dissertations covered with incomprehensible hieroglyphs. "Strangely enough," she says in her memoirs, "when, at the age of sixteen, I began studying the differential calculus, my teacher was astonished at the rapidity with which I understood him—'just as if it was a reminiscence of something that you knew before,' he said. The continual reading of the wall-papers certainly left some unconscious traces in my childish mind."

P. K.

NOTES.

THE Bureau of the International Congress of Geologists has decided that its fifth session shall be held at Washington, and the date of the session has been fixed for the last Wednesday (26th) of August 1891. The annual meeting of the American Association for the Advancement of Science and the summer meeting of the Geological Society of America will be held in the same city during the preceding week. A circular, signed by J. S. Newberry, chairman, and H. S. Williams and S. F. Emmons, secretaries, has been issued, cordially inviting geologists to take part in the labours of the Congress, and, if they desire to do so, to address their request for inscription as members of the Congress to the Secretary's office (1330 F Street, Washington, D.C.). The Committee of Organization will try to obtain from the ocean steamship lines the most favourable terms for the transportation of foreign members to and from the United States, and to arrange with the respective railroad companies for reduced rates for the geological excursions. They point out that, to accomplish this satisfactorily, it is important they should know beforehand the approximate number of members who propose to attend the meeting. They desire also to have an expression of opinion from these members in order to arrange in advance a series of excursions to places that will be of interest to the greatest number. Owing to the large number of points of geological interest, and to the great distances to be traversed, it would be impossible for the Committee to arrange these excursions, so that their expense should fall within reasonable limits, without some such previous information.

IT has been arranged that the afternoon meeting to celebrate the Chemical Society's jubilee, on February 24, at 3 p.m., shall be held in the theatre of the London University, Burlington Gardens, instead of at the Society of Arts, as the number of Fellows who have notified their intention of attending the celebration is larger than can be accommodated in the meeting-room of the Society of Arts. A number of distinguished foreigners are expected to be present—M. Gautier, President; M. Combes, Vice-President; and M. Haller, member of Council of the Société Chimique de Paris; Drs. Wichelhaus and Will, of Berlin, representing the Deutsche Chemische Gesellschaft; and Prof. Victor Meyer, of Heidelberg.

LORD LILFORD AND MR. WILSON NOBLE deserve the thanks of all genuine lovers of nature for calling attention to the scheme whereby an enterprising Birmingham Company proposed to take from the Shetland Islands, during the approaching spring, no fewer than 20,000 eggs, including "many beautiful and rare varieties." A question on the subject was asked in the House of Commons on Tuesday by Mr. W. James, in reply to whom the Lord Advocate suggested that Mr. A. Pease's Wild Birds' Protection Bill, which had been read a first time, might afford an opportunity for extending to the eggs of wild birds the protection at present given to wild birds themselves. In accordance with this suggestion, Mr. W. Noble proposes to move an instruction to the Committee on Mr. Pease's Bill extending the operation of the measure to birds' eggs. Meanwhile, the Birmingham Company has announced that the proposed "oological expedition" has been abandoned.

THE Cambridge Medical Graduates' Club are to give a dinner to Sir G. M. Humphry, F.R.S., at the Marlborough Rooms, Regent Street, next Tuesday.

ON Sunday, February 8, a *fête* was held at Naples in honour of the fiftieth anniversary of Prof. Arcangelo Scacchi's Professorship of Mineralogy in the University of that city. The large hall of the apartments of the Royal Academy was crowded by delegates from all the Universities of Italy, as well as some foreign ones. Nearly every scientific institution of Italy, and not a few institutions of other nations, were represented. The Geological Society of London and the Mineralogical Society of Great Britain had deputed Dr. Johnston-Lavis to convey their congratulations to the eminent mineralogist, who on that day attained the age of eighty-one years. Prof. A. Scacchi was deeply touched by the numerous speeches, and especially by that of the Mayor of Gravina di Puglia, where the Professor was born, and where a true hero worship has sprung up around his name. A large gold medal, bearing on one side the head of the veteran man of science, and on the other a suitable inscription, was presented to him, together with a beautiful illuminated parchment executed by Mr. L. Sambon. Much credit is due to the committee, and especially to Profs. Bassani and Oglialoro, the Secretary and Treasurer, for the success of the celebration. A pamphlet will be printed containing a biography of Prof. A. Scacchi, a list of his works, an account of the celebration, and the different congratulatory letters, telegrams, and speeches on the occasion; and a copy will be sent to each subscriber. Prof. A. Scacchi has resigned the Chair of Mineralogy, and his son, a promising young investigator, Prof. Eugenio Scacchi, takes his place in the University of Naples.

THE French scientific journals record the death of M. Jacques Armengaud, well known as an engineer, and formerly a professor at the Conservatoire des Arts et Métiers. He was the author of some important technological works.

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